REMARKS

CLAIM OBJECTIONS

In the Office Action claim 1 was objected to because "comprising at least on letter" should have been -- comprising at least one letter --. With the present amendment, claim 1 has been amended to correct this error. Applicants appreciate the Examiner brining this error to their attention.

SECTION 102 REJECTIONS

CLAIMS 1-6

Claims 1-6 were rejected under 35 U.S.C. §102(e) as being anticipated by Coorman et al. (U.S. Patent Publication 2005/0182629, hereinafter Coorman).

Independent claim 1 provides a method of segmenting words into component parts. Under the method, a mutual information score is determined for a pair of graphoneme units comprising a first graphoneme unit and a second graphoneme unit. The mutual information score is determined using the probability of the first graphoneme unit appearing immediately after the second graphoneme unit, the probability of the first graphoneme unit and the probability of the second graphoneme unit. Each graphoneme unit comprises at least one letter in the spelling of a word. The mutual information score is used to combine the first and second graphoneme units into a larger graphoneme unit. Words are segmented into component parts to form a sequence of graphonemes based on the larger graphoneme unit.

With the present amendment, claim 1 has been amended to clarify the meaning of mutual information. Support for this amendment is found on page 16, lines 4-15.

As amended, claim 1 is not shown or suggested in Coorman. In particular, Coorman does not determine a mutual information score for a pair of graphoneme units using the probability of the first graphoneme unit appearing immediately after the second graphoneme unit, the probability of the first graphoneme unit and the probability of the second graphoneme unit.

In the Office Action, paragraphs 24, 83, 138, and 158 of Coorman were said to show the step of determining mutual information scores for graphoneme units. However, none of the cited paragraphs mention mutual information. In addition, none of the cited paragraphs

mention determining mutual information for a pair of graphoneme units based on the probability of one graphoneme unit immediately following another graphoneme unit and the probabilities of each of the graphoneme units. As such, Coorman does not show or suggest the invention of claim 1 or claims 2-6, which depend therefrom.

CLAIMS 7-15

Claims 7-15 were rejected under 35 U.S.C. §102(e) as being anticipated by Coorman.

Claim 7 provides a computer-readable medium having computer-executable instructions for performing a series of steps. The steps include determining mutual information scores for pairs of graphoneme units found in a set of words where a graphoneme unit comprises at least one letter. Each mutual information score is based on the probability of one graphoneme unit of the pair of graphoneme units appearing immediately after the other graphoneme unit of the pair of graphoneme units, and the unigram probabilities of each graphoneme unit in the pair of graphoneme units. The graphoneme units are combined to form a new graphonome unit based on the mutual information scores. A set of graphoneme units is identified for a word based in part on the new graphoneme unit.

With the present amendment, claim 7 has been amended to further clarify the calculation of a mutual information score. Support for this amendment is found on page 16 of the specification.

As amend, claim 7 is not shown or suggested in Coorman. In particular, Coorman does not show the calculation of a mutual information score based on the probability of one graphoneme unit of the pair of graphoneme units appearing immediately after the other graphoneme unit of the pair of graphoneme units, and the unigram probabilities of each graphoneme unit in the pair of graphoneme units. In fact, the cited paragraphs make no mention of mutual information scores. As such, Coorman does not show or suggest the invention of claim 7 or claims 8-15, which depend therefrom.

CLAIM 16

Claim 16 was rejected under 35 U.S.C. §102(e) as being anticipated by Okimoto et al. (U.S. Patent Publication 2005/0256715, hereinafter Okimoto).

Claim 16 provides a method of segmenting a word into syllables. The method comprises segmenting a set of words into phonetic syllables using mutual information scores wherein using mutual information scores comprises computing a mutual information score for two phones based on the probability of the two phones appearing next to each other in the set of words and the unigram probabilities of each of the two phones in the set of words. The segmented set of words is used to train a syllable n-gram model. The syllable n-gram model is then used to segment a phonetic representation of a word into syllables via forced alignment.

Claim 16 has been amended to further define mutual information scores. Support for this amendment is found on page 16 of the specification.

As amend, claim 16 is not shown or suggested in Okimoto. In particular, Okimoto does not show or suggest using mutual information scores to segment a set of words into phonetic syllables. In the Office Action, paragraphs 198 and 199 were said to show using mutual information to segment words into phonetic syllables. However, paragraphs 198 and 199 make no mention of mutual information and in particular do not mention using mutual information that is computed based on the probability of two phones appearing next to each other in a set of words as well as the unigram probabilities of each of the two phones in the set of words. In paragraph 199, Okimoto does discuss the conditional probability of a syllable M2 given a syllable M1 as being calculated as the frequency of the chain M1 and M2 divided by the frequency of M1. However, this is different from a mutual information score since the frequency of a chain M1 and M2 is not the same as a probability of the chain M1 and M2 and because the frequency of M1 is not the same as the probability of M1. Further, the conditional probability of M2 given M1 does not utilize the unigram probability of M2. Thus, a conditional probability is substantially different from mutual information.

Since Okimoto does not show or suggest segmenting a set of words into phonetic syllables using mutual information scores, it does not show or suggest the invention of claim 16.

CLAIM 17

Claim 17 was rejected under 35 U.S.C. §102(e) as being anticipated by Okimoto.

Claim 17 provides a method of segmenting a word into morphemes. Under the method, a set of words is segmented into morphemes using mutual information scores wherein using mutual information scores comprises computing a mutual information score for two letters based on the probability of the two letters appearing next to each other in the set of words and the unigram probabilities of each of the two letters appearing in the set of words. The segmented set of words is used to train a morpheme n-gram model. The morpheme n-gram model is then used to segment a word into morphemes via forced alignment.

The invention of claim 17 is not shown or suggested in Okimoto. In particular, Okimoto does not show or suggest segmenting a set of words into morphemes using mutual information scores. In the Office Action, paragraphs 99-116 of Okimoto were cited as showing this step. Applicants respectfully dispute this assertion.

In the cited paragraphs, Okimoto makes no mention of mutual information. Paragraphs 104, 105 and 114 do discuss conditional probabilities. However, these conditional probabilities are not the same as mutual information as noted above. In particular, the conditional probabilities do not utilize a probability of two letters appearing next to each other as well as the unigram probabilities of each of the two letters appearing in the set of words. Since Okimoto does not show or suggest using the mutual information score for two letters to segment a set of words into morphemes, it does not show or suggest the invention of claim 17.
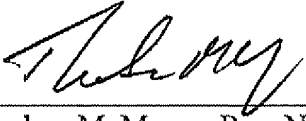
CONCLUSION

In light of the above remarks, claims 1-17 are in form for allowance. Reconsideration and allowance of the claims is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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